US009261321B2

(12) **United States Patent**
Yi et al.

(10) **Patent No.: US 9,261,321 B2**
(45) **Date of Patent: Feb. 16, 2016**

(54) **SELF-TUNABLE COMPOUND BOW**

(71) Applicant: **WIN & WIN Co., Ltd.**, Gyeonggi-do (KR)

(72) Inventors: **Chang Ho Yi**, Incheon (KR); **Dong Won Park**, Seoul (KR)

(73) Assignee: **WIN & WIN Co., Ltd.** (KR)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **14/468,418**

(22) Filed: **Aug. 26, 2014**

(65) **Prior Publication Data**

US 2015/0083099 A1 Mar. 26, 2015

(30) **Foreign Application Priority Data**

Aug. 30, 2013 (KR) 10-2013-0104033
Dec. 23, 2013 (KR) 10-2013-0161527

(51) **Int. Cl.**
F41B 5/10 (2006.01)

(52) **U.S. Cl.**
CPC ***F41B 5/105*** (2013.01)

(58) **Field of Classification Search**
CPC F41B 5/10; F41B 5/105
USPC 124/25.6
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,960,778	A *	10/1999	Larson	F21B 5/10 124/25.6
6,691,692	B1	2/2004	Adkins	
8,156,928	B1	4/2012	Blahnik	
8,281,774	B2	10/2012	Grace	
2004/0074485	A1 *	4/2004	Cooper	F41B 5/10 124/25.6
2012/0000451	A1 *	1/2012	Grace	F41B 5/10 124/25.6
2013/0068206	A1	3/2013	Langley	
2015/0153132	A1 *	6/2015	Yi	F41B 5/105 124/25.6

* cited by examiner

Primary Examiner — Gene Kim
Assistant Examiner — Jeffrey Vanderveen
(74) *Attorney, Agent, or Firm* — Berenato & White, LLC

(57) **ABSTRACT**

Provided is a self-tunable compound bow including: a bow main body including a pair of limbs that are respectively coupled to both ends of a handle; upper and lower pulley assemblies that are respectively coupled to the rear end of each limb; a bowstring; and first and second cam cables that are wound around a cam of each of the upper and lower pulley assemblies as the bowstring is pulled. A contact pin is formed in one of the pulley assemblies, in which the contact pin is in contact with the first cam cable when the bowstring is pulled, and an indicator is formed in the other of the pulley assemblies, in which the indicator is in contact with the second cam cable and moves when the bowstring is pulled in a guide hole formed in the pulley of the other of the pulley assemblies.

10 Claims, 13 Drawing Sheets

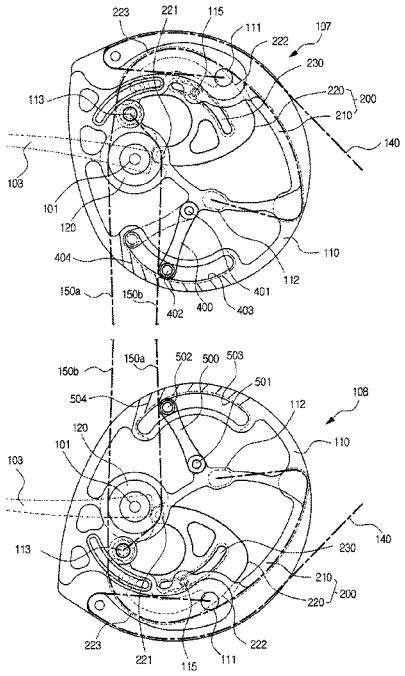


FIG.1

(PRIOR ART)

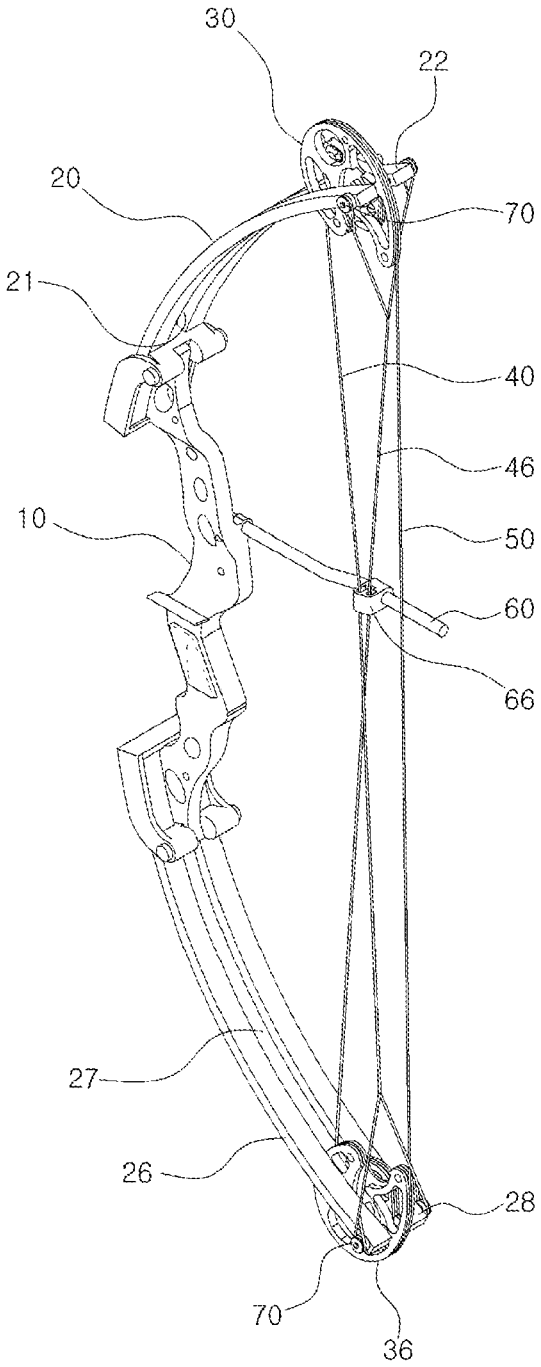


FIG.2

(PRIOR ART)

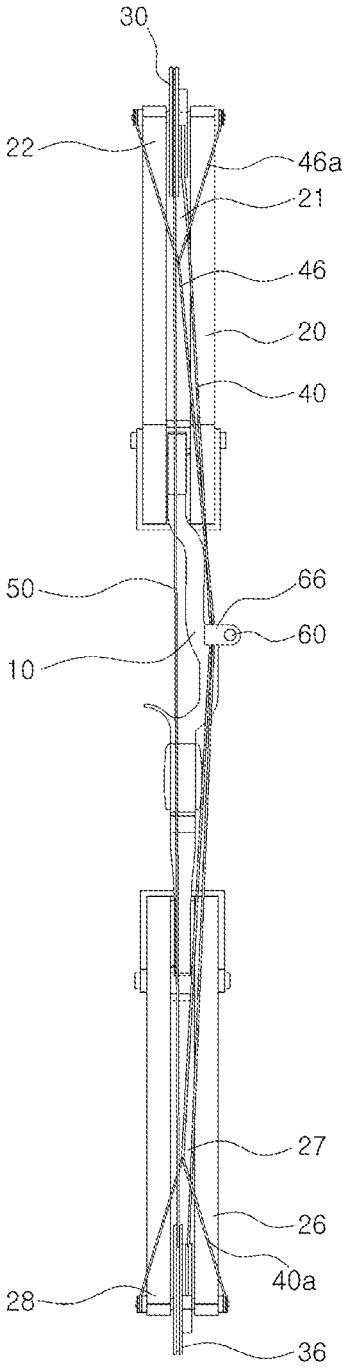


FIG.3

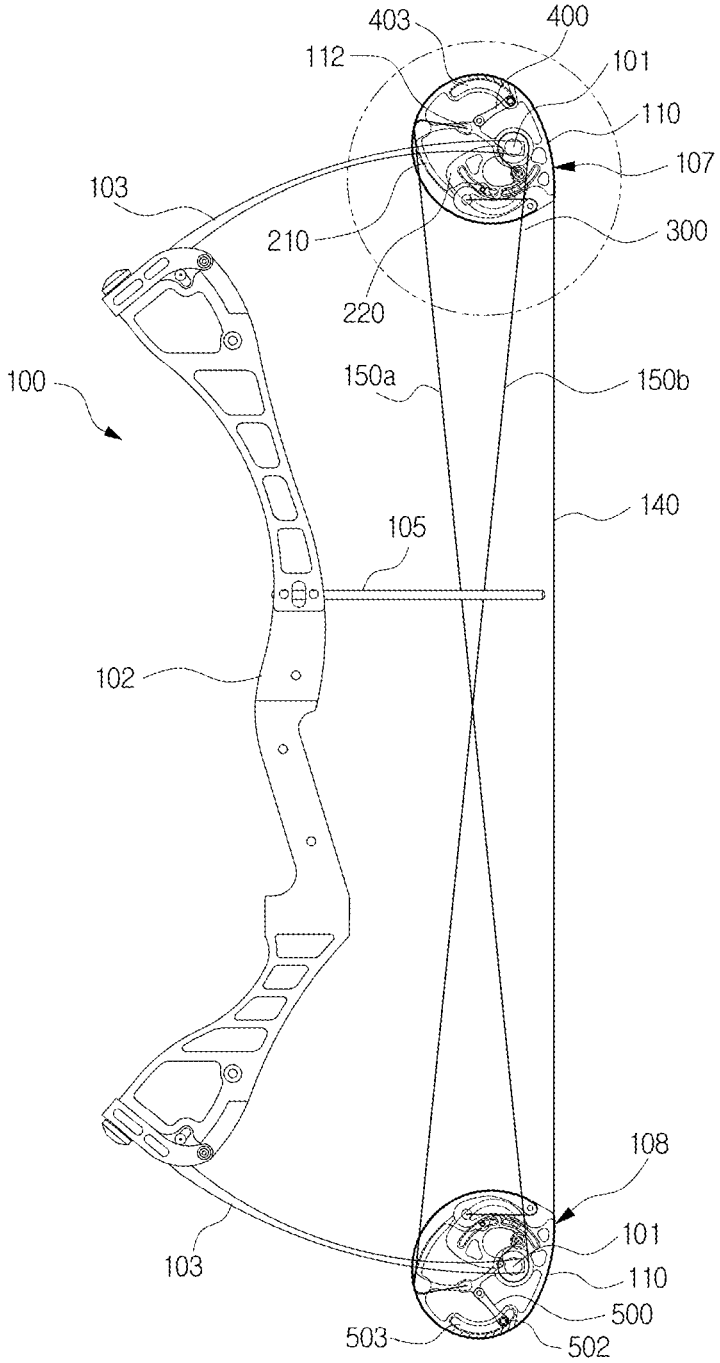

403
400
112
101
110
107
103
210
300
220
150a
150b
100
140
105
102
108
101
103
110
500
503
502

FIG.4

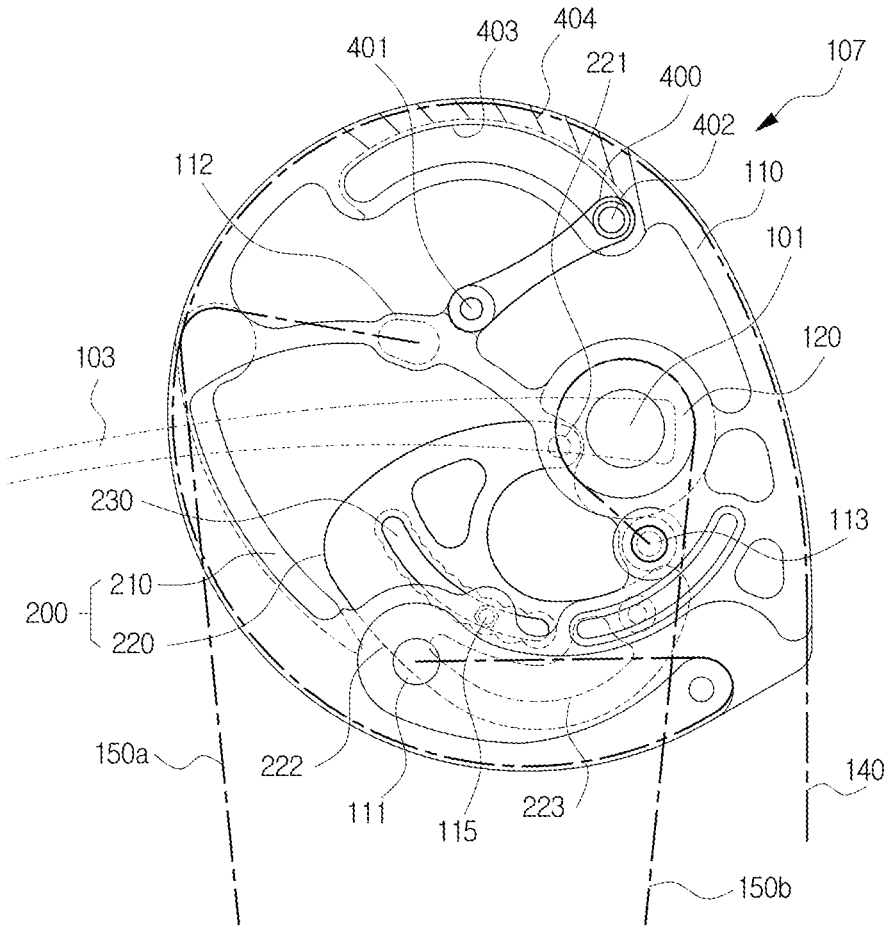

401
403
404
221
400
107
402
112
110
101
120
103
230
113
210
200
220
150a
222
111
115
223
140
150b

FIG.5

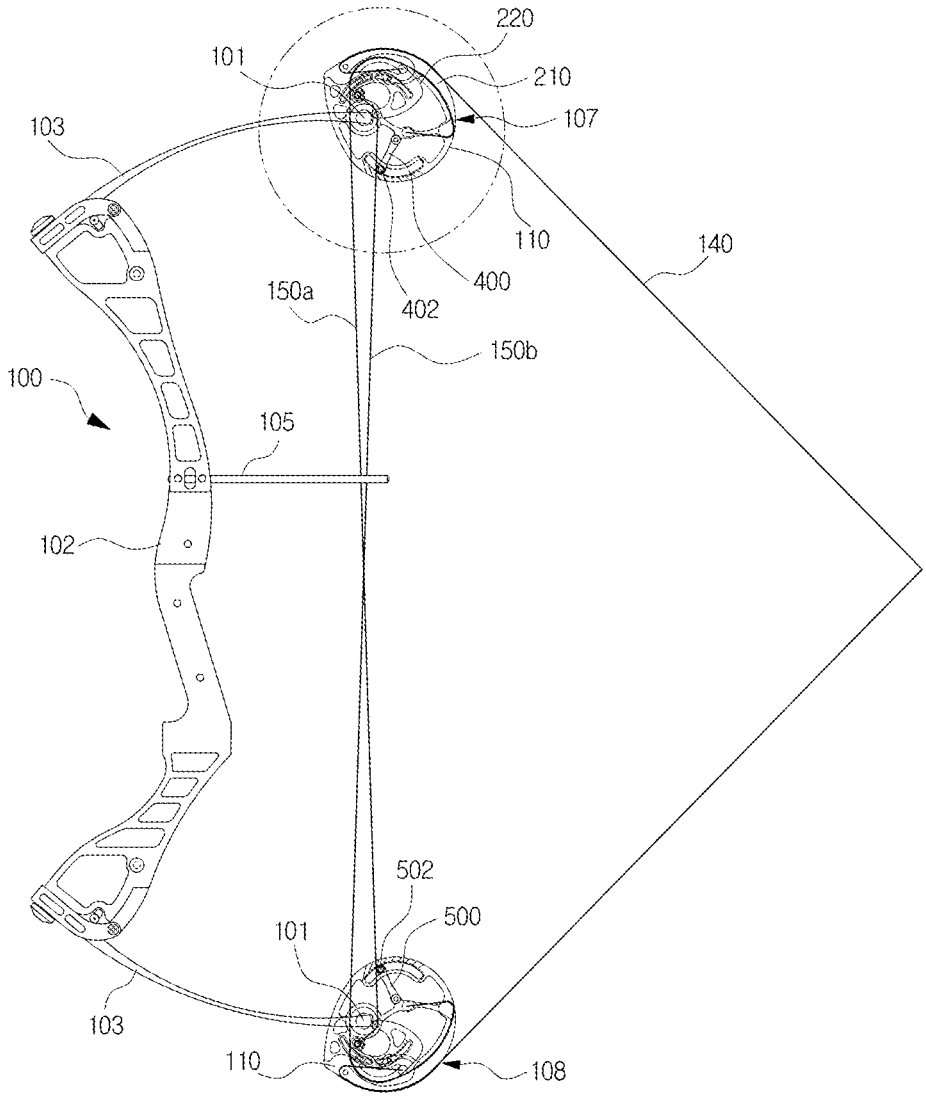

220
101
210
107
103
110
140
400
150a
402
150b
100
105
102
502
500
101
103
110
108

FIG.6

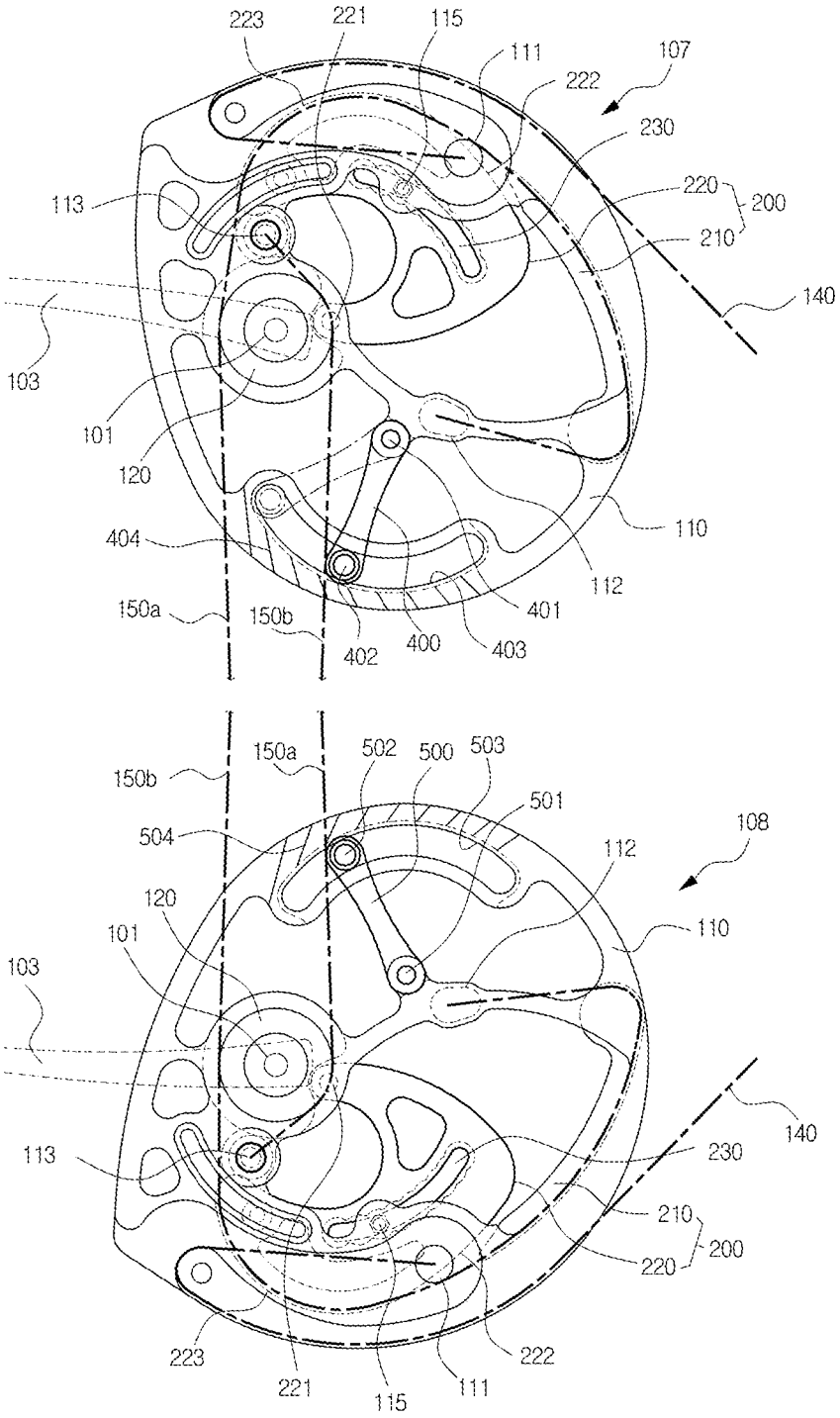

223
221
115
111
107
222
230
220
200
210
113
140
103
101
120
110
404
112
150a
150b
402
400
403
401
108
502
500
503
501
504
112
120
110
101
103
140
230
210
220
200
113
223
221
115
111
222

FIG.7

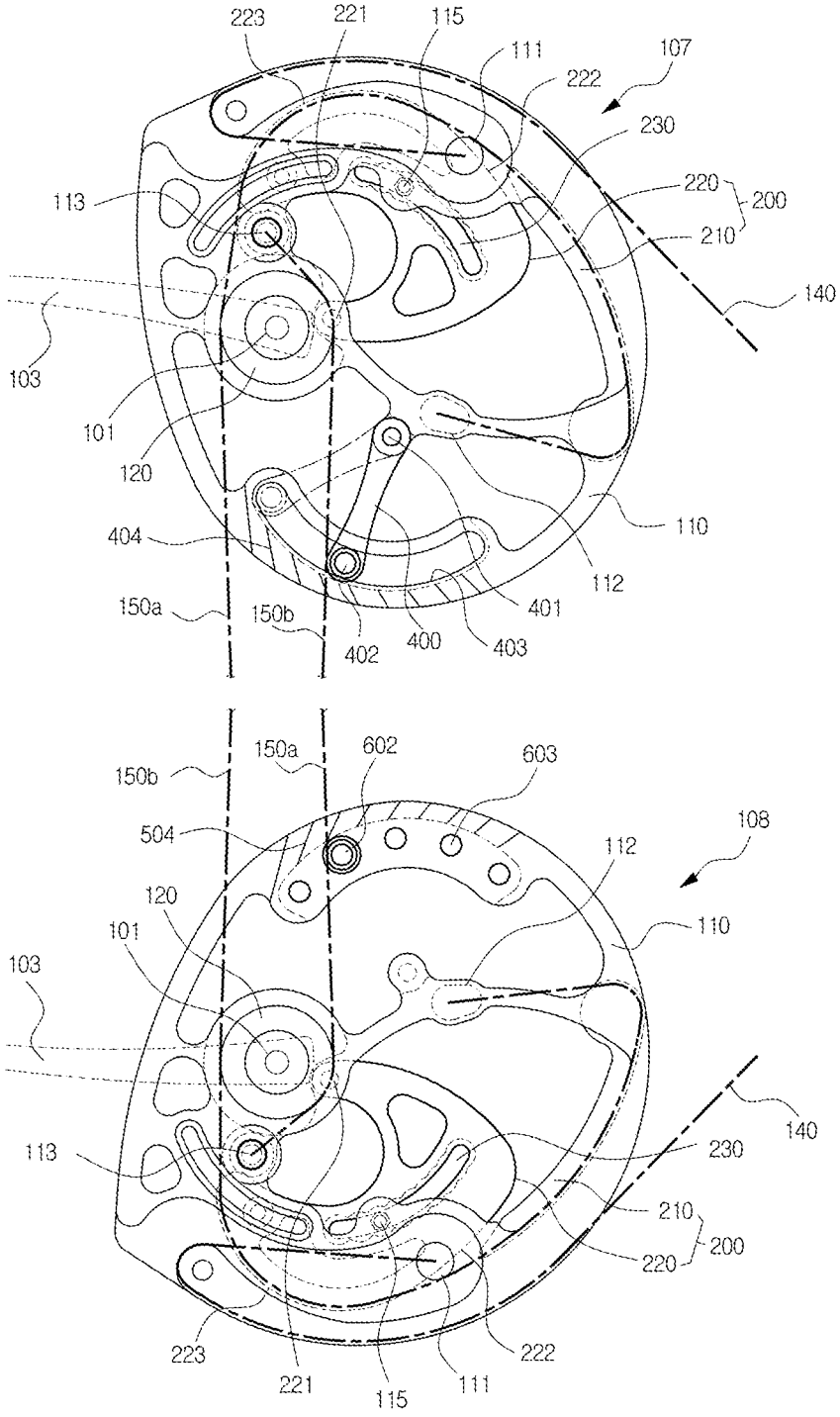

223
221
115
111
107
222
230
220
200
210
113
140
103
101
120
110
404
112
150a
150b
401
402
400
403
150b
150a
602
603
504
108
112
120
110
101
103
140
230
113
210
200
220
223
221
115
111
222

FIG.8

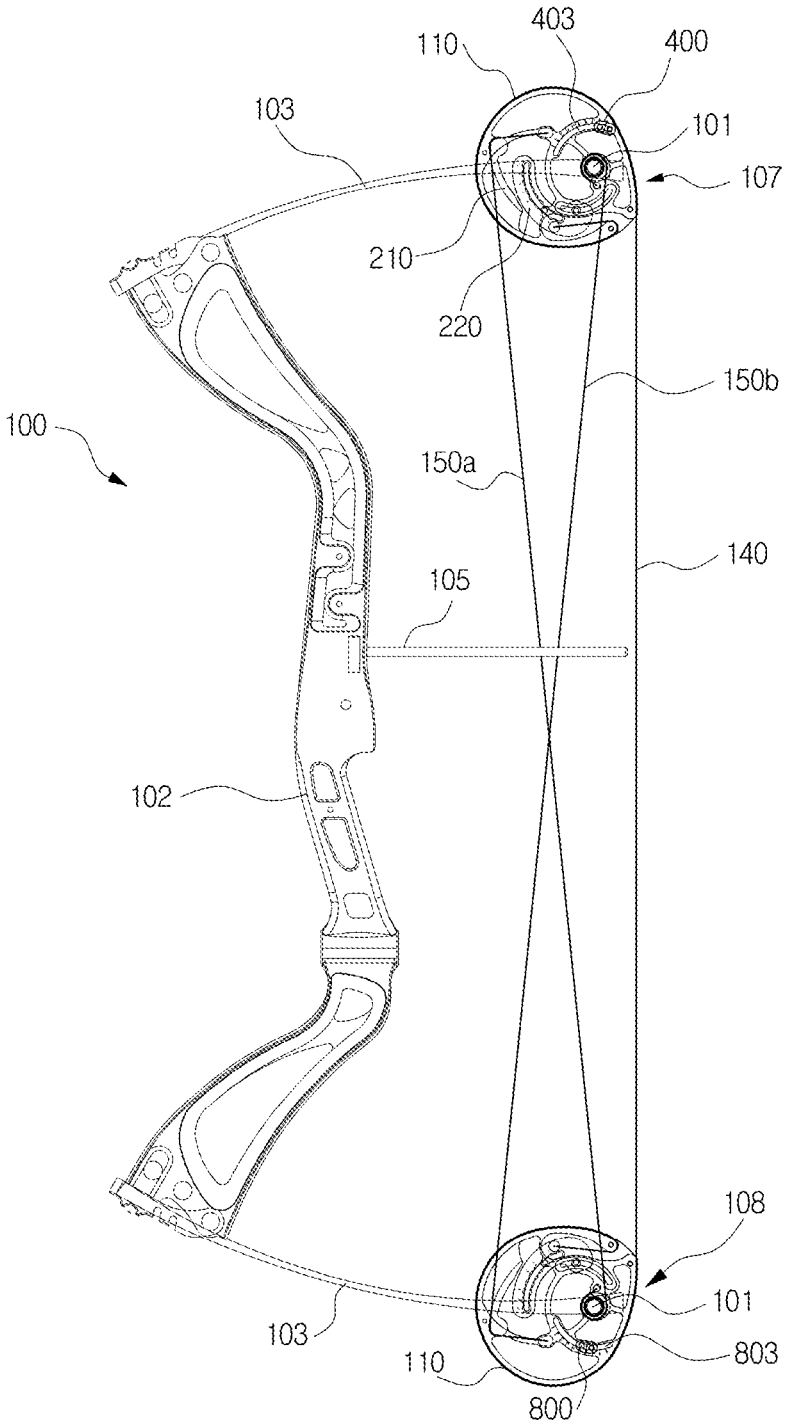

403
110
400
103
101
107
210
220
150b
100
150a
140
105
102
108
101
103
803
110
800

FIG.9

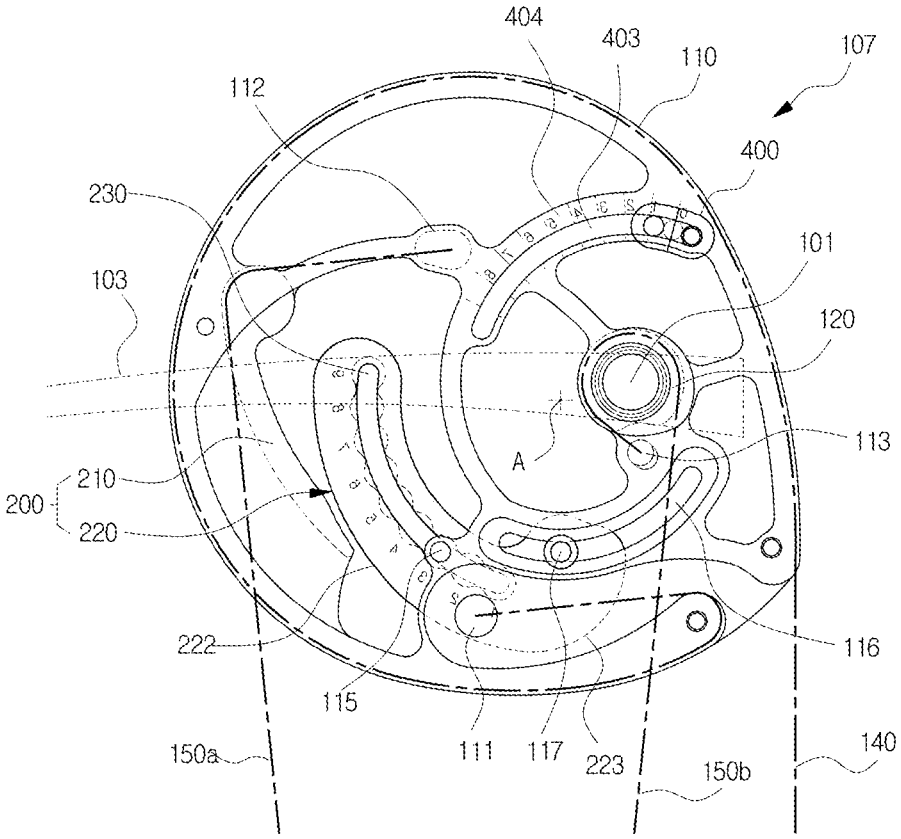

404
403
110
107
112
400
230
101
103
120
113
A
200
210
220
222
116
115
111
117
223
150a
150b
140

FIG.10

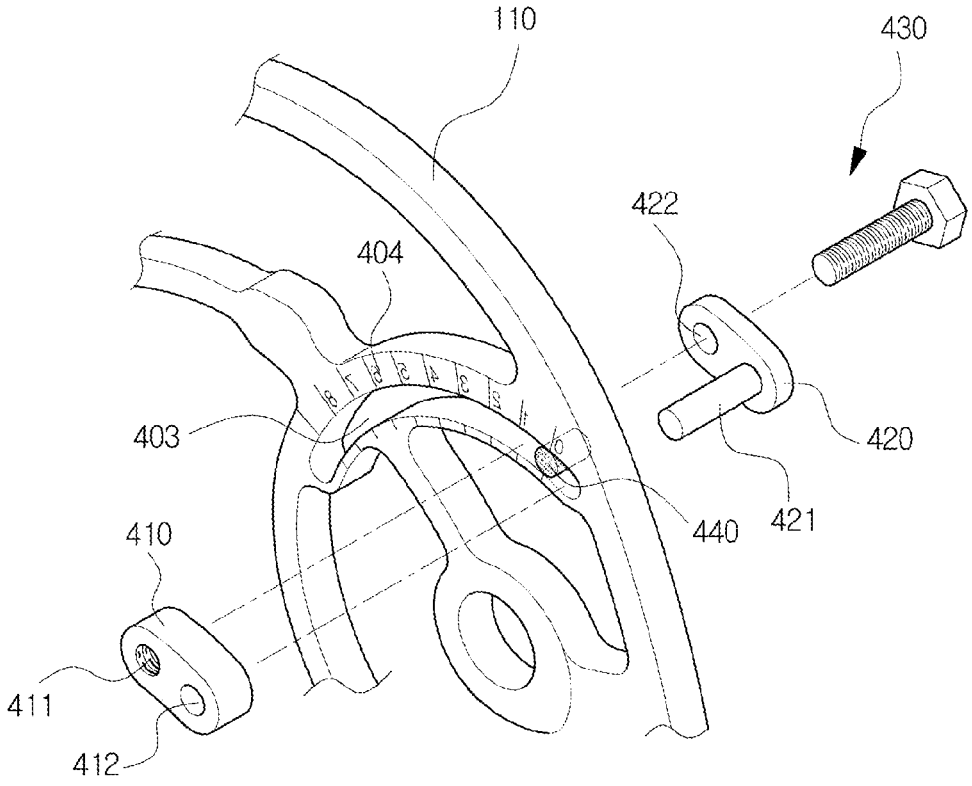


FIG.11

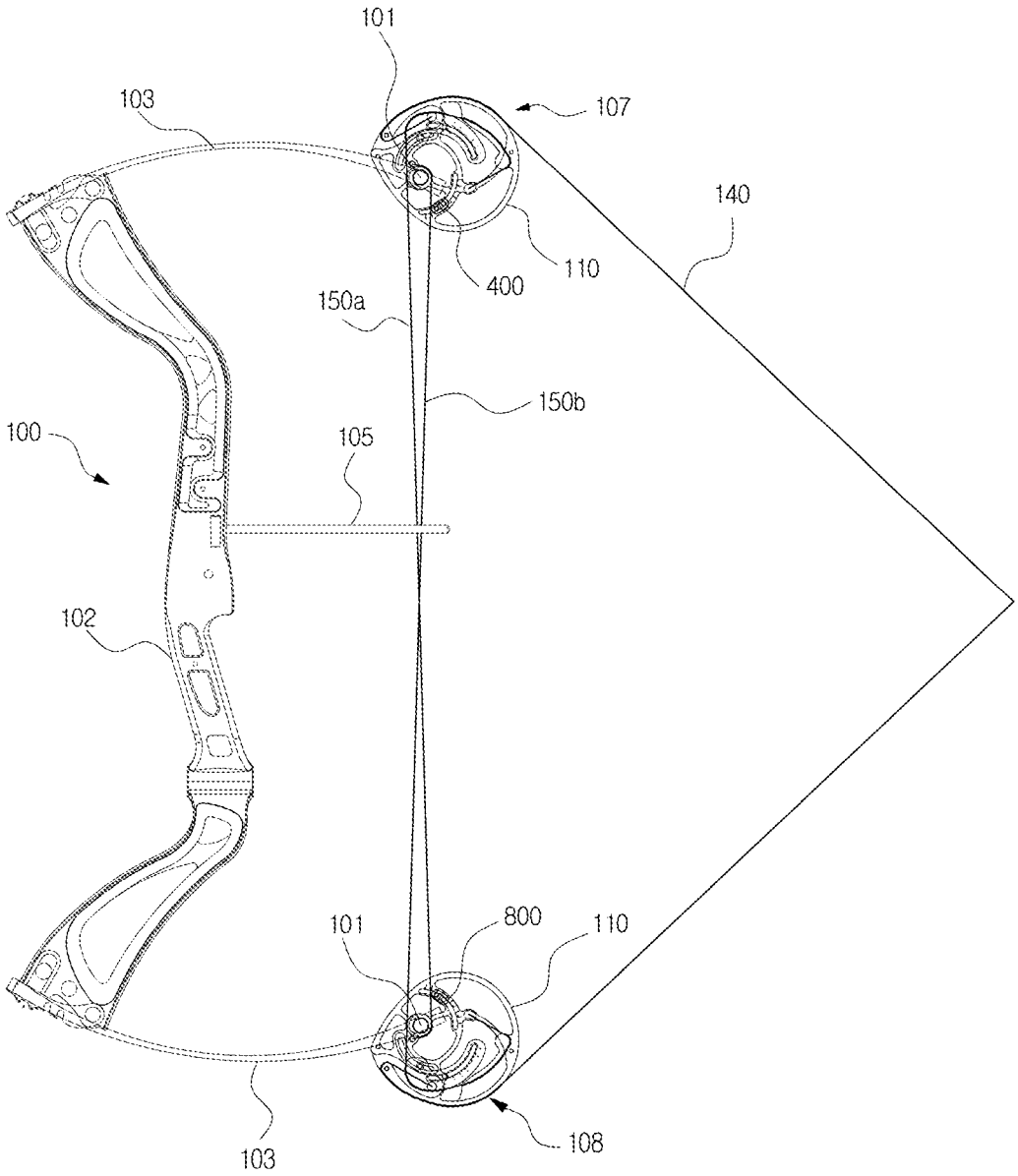

101
103
107
140
110
400
150a
150b
100
105
102
101
800
110
103
108

FIG.12

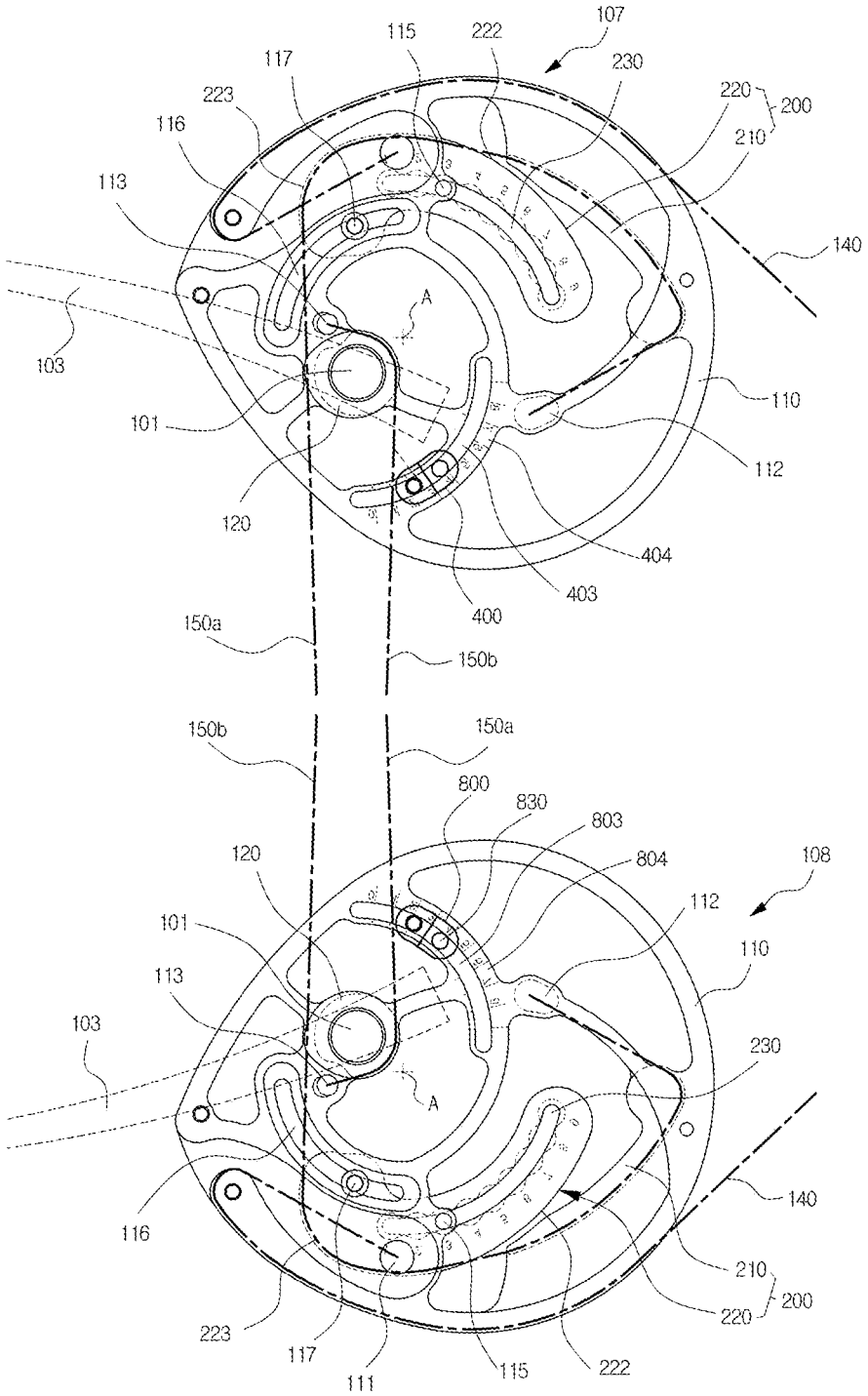
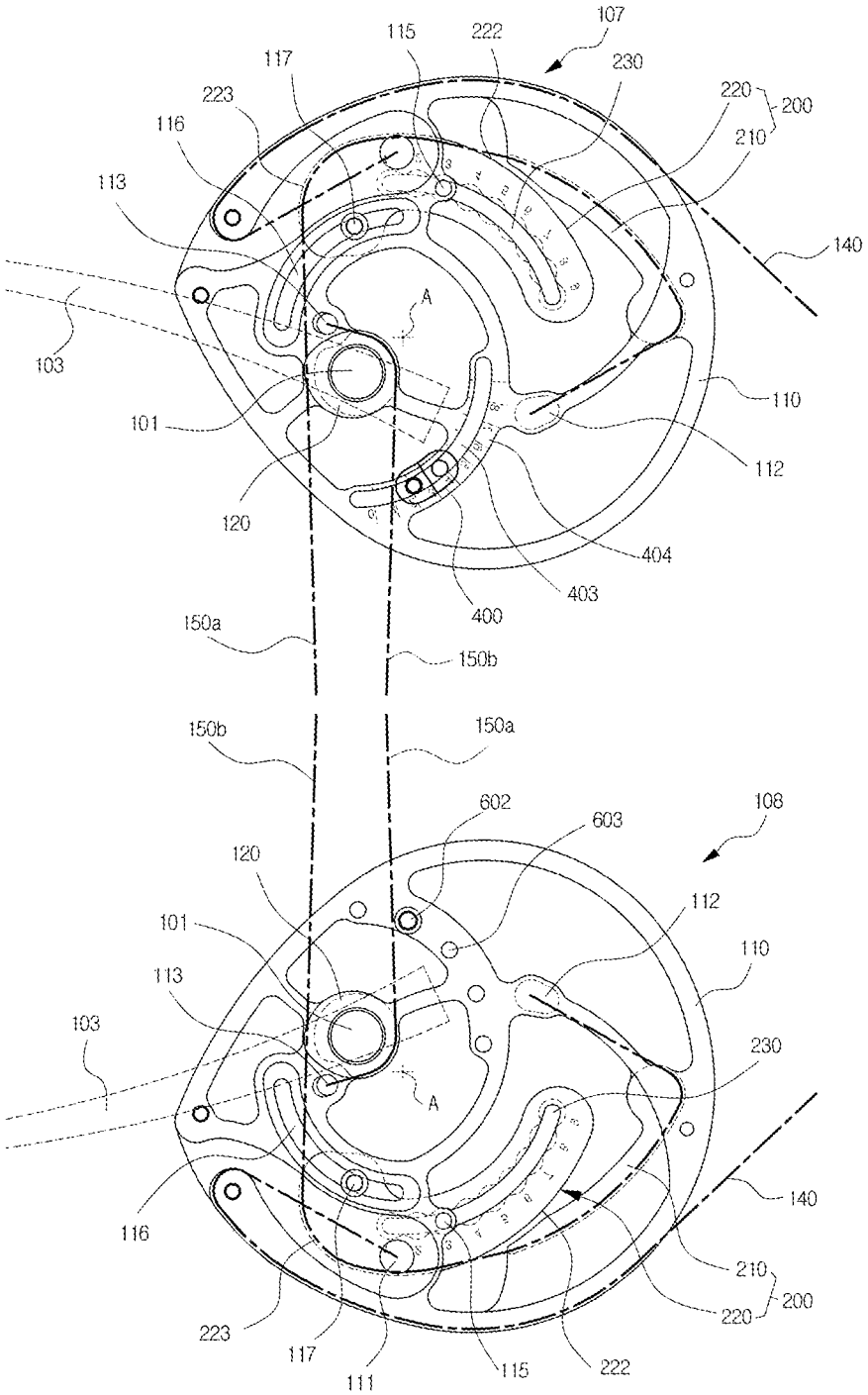

107
115
222
117
230
223
220
200
116
210
113
140
A
103
110
101
112
120
404
403
400
150a
150b
150b
150a
800
830
803
120
804
108
112
101
110
113
103
230
A
140
116
210
220
200
223
117
111
115
222

FIG.13


107
115
222
117
230
223
220
200
116
210
113
140
A
103
110
101
112
120
404
403
400
150a
150b
150b
150a
602
603
108
120
112
101
110
113
103
230
A
140
116
210
220
200
223
117
111
115
222

SELF-TUNABLE COMPOUND BOW

CROSS-REFERENCE TO RELATED APPLICATION

This application claims the benefit of Korean Patent Application No. 10-2013-0104033, filed on Aug. 30, 2013, and No. 10-2013-0161527, filed on Dec. 23, 2013 in the Korean Intellectual Property Office, the disclosure of which is incorporated herein in its entirety by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a compound bow, and more particularly, to a self-tunable compound bow which can self-align length of cam cables alone so that rotational angles of upper and lower cams become identical when a bowstring has been pulled.

2. Description of the Related Art

Typically, compound bows are configured so that a bowstring may be easily pulled without using a large force and arrow shooting power is increased during shooting, by using an effect of a cam or wheel, to thus result in a fast speed of an arrow and have very strong power, and are widely used mainly for hunting.

As shown in FIGS. **1** and **2**, a conventional compound bow is configured to have upper limbs **20** that are coupled to the upper portion of a handle **10** at the center of which a grip portion is formed, and lower limbs **26** coupled to the lower portion of the handle **10**. A cut-out portion **21** is formed between the upper limbs **20** whose edges **22** are spaced apart from each other, and a cut-out portion **27** is formed between the lower limbs **26** whose edges **28** are spaced apart from each other. Rotating shafts **70** are horizontally formed through the edges **22** of the upper limbs **20** and the cut-out portion **21**, and through the edges **28** of the lower limbs **26** and the cut-out portion **27**, respectively. Upper and lower pulleys **30** and **36** are rotatably combined with the respective rotating shafts **70**.

A bowstring **50** is wound along a guide groove of each pulley **30** or **36**, and the respective ends of the bowstring **50** are combined with each pulley **30** or **36**. In addition, a cam **32** or **38** rotating with the pulley **30** or **36** is coupled in each pulley **30** or **36**. As the bowstring **50** is pulled, cam cables **40** and **46** are formed so as to be wound on the cams **32** and **38**, respectively. One end of each cam cable **40** or **46** is coupled to a pulley **30** or **36** to which each cam **32** or **38** is coupled, and the other end of each cam cable **40** or **46** is coupled to each rotating shaft **70** at both sides of the cut-out portion **21** or **27** of each of the opposing limbs **20** and **26** in the form of Y-shaped buss cables **40***a* and **46***a*.

Further, a cable guard **60** is laterally mounted at one side of a center portion of a handle **10**, in which the cable guard **60** pushes the cam cables **40** and **46** to one side of the bowstring **50** so that an arrow is not prevented from being shot during shooting. In addition, a slide **66** is movably mounted on the cable guard **60** in which the cam cables **40** and **46** are inserted into the slide **66**.

When the bowstring **50** is pulled in the prior art compound bow that is configured as described above, the lower and upper pulleys **30** and **36** are rotated and thus the cams **32** and **38** coupled to the lower and upper pulleys **30** and **36** are rotated, to thereby wind and pull the cam cables **40** and **46**. When the bowstring **50** is released in a let-off state, an arrow obtains a strong driving force by a strong elastic force of the bow which returns to an original position instantaneously.

However, due to the strength of the limbs **20** and **26** or a change in a point at which the bowstring **50** is pulled in the compound bow, the rotational angles of the upper and lower cams **32** and **38** may be changed when the bowstring **50** is pulled and thus is at a let-off state. In this case, since both the two cams **32** and **38** do not become at a let-off state, the original strength of the bow is not exhibited and the accuracy of an arrow is reduced.

As described above, in the case that the rotational angles of the upper and lower cams **32** and **38** are changed, the lengths of the cam cables **40** and **46** may be adjusted in order to set the rotational angles of the upper and lower cams **32** and **38**. However, it is difficult to determine difference in the rotational angles of the upper and lower cams **32** and **38**, by a bowyer alone. As a result, since it is difficult to adjust the lengths of the cam cables, it is inconvenient for the other person to determine and tell difference in the rotational angles of the upper and lower cams **32** and **38** when a bowyer pulls the bowstring **50**.

SUMMARY OF THE INVENTION

To solve the above conventional problems or defects, it is an object of the present invention to provide a self-tunable compound bow that enables a bowyer alone to set rotational angles of upper and lower cams identically.

To accomplish the above and other objects of the present invention, according to an aspect of the present invention, there is provided a self-tunable compound bow comprising:

a bow main body including a handle at a central portion of which a grip portion is formed and a pair of limbs that are respectively coupled to both ends of the handle;

upper and lower pulley assemblies each including a pulley that is rotatably coupled to a rotating shaft formed on the rear end of each limb, and a cam that is coupled to one side of the pulley and rotating with the pulley;

a bowstring whose either end is wound and coupled to the pulley of each of the upper and lower pulley assemblies; and

first and second cam cables that are wound around the cam of each of the upper and lower pulley assemblies as the bowstring is pulled, in which one end of each of the first and second cam cables is coupled to one of the upper and lower pulley assemblies, and the other end thereof is coupled to the other of the upper and lower pulley assemblies;

wherein a contact pin is formed in one of the pulley assemblies, in which the contact pin is coupled to a coupling hole that is formed in the pulley of the one of the pulley assemblies, and is in contact with the first cam cable when the bowstring is pulled, and

wherein an indicator is formed in the other of the pulley assemblies, in which the indicator is in contact with the second cam cable and moves when the bowstring is pulled in a guide hole formed in the pulley of the other of the pulley assemblies.

Preferably but not necessarily, one end of the indicator is rotatably coupled to a pivot shaft that is formed in the pulley, and a contact protrusion is formed in the other end thereof in which the contact protrusion is in contact with the second cam cable and moves within the guide hole that is configured in an arc-shaped form.

Preferably but not necessarily, a position display part is formed around the guide hole, in order to display a position to which the indicator moves while contacting the second cam cable.

Preferably but not necessarily, the coupling hole has a predetermined length and the contact pin is coupled at any position in the coupling hole.

Preferably but not necessarily, a pivoting member one end of which is pivotably coupled to the pivot shaft that is formed in the pulley is provided in the pulley assembly to which the contact pin is coupled, and the contact pin is coupled at the other end of the pivoting member.

Preferably but not necessarily, a plurality of the coupling holes are formed in which the contact pin is coupled to one of the plurality of the coupling holes.

Preferably but not necessarily, the cam of each pulley assembly comprises: a cam cable winding portion fabricated in an arc-shaped form and on which the cam cables are wound; a cam module that comprises a pivot shaft at a position spaced by a predetermined distance from the rotating shaft of the pulley to which the cam is coupled, and that is rotatably coupled to the pivot shaft by a predetermined angle from the cam cable winding portion, in which the cam cables are wound around the cam cable winding portion and then sequentially wound on the outer circumferential surface of the cam module when the bowstring is pulled; and a fixing unit that makes the cam module rotated by a predetermined angle around the pivot shaft in order to control the draw length of the let-off state of the compound bow, and that makes the cam module fixed to the pulley at a position where the cam module has been rotated.

Preferably but not necessarily, as the fixing unit that makes the cam module fixed to the pulley, an arc-shaped positioning hole centered at the pivot shaft of the cam module is formed in the cam module, and a coupling hole is formed in the pulley to which the cam module is coupled, in which the cam module is coupled to the coupling hole and the positioning hole together with a coupling member and thus is coupled to the pulley.

Advantageous Effects

As described above, the present invention provides a self-tunable compound bow that enables a bowyer alone to set rotational angles of upper and lower cams identically.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a conventional compound bow.

FIG. **2** is a rear view of the compound bow of FIG. **1** seen from the rear side thereof.

FIG. **3** is a side view showing a compound bow according to a first embodiment of the present invention before a bowstring is pulled.

FIG. **4** is a detailed view of a pulley assembly that is coupled to one of limbs in FIG. **3**.

FIG. **5** is a side view showing the compound bow according to the first embodiment of the present invention after a bowstring has been pulled.

FIG. **6** is a side view showing upper and lower pulley assemblies in order to describe operation of an indicator in the compound bow according to the first embodiment of the present invention.

FIG. **7** is a side view showing another example of a contact pin and a coupling hole in FIG. **6**.

FIG. **8** is a side view showing a compound bow according to a second embodiment of the present invention before a bowstring is pulled.

FIG. **9** is a detailed view of a pulley assembly that is coupled to one of limbs in FIG. **8**.

FIG. **10** is a partial exploded perspective view of FIG. **9**.

FIG. **11** is a side view showing the compound bow according to the second embodiment of the present invention after a bowstring has been pulled.

FIG. **12** is a side view showing upper and lower pulley assemblies in order to describe operation of an indicator in the compound bow according to the second embodiment of the present invention.

FIG. **13** is a side view showing another example of a contact pin and a coupling hole in FIG. **12**.

DETAILED DESCRIPTION OF THE INVENTION

The above and/or other objects and/or advantages of the present invention will become more apparent by the following description of embodiments of the present invention.

Hereinbelow, a self-tunable compound bow according to preferred embodiments of the present invention will be described in more detail with reference to the accompanying drawings.

FIG. **3** is a side view showing a compound bow according to a first embodiment of the present invention before a bowstring is pulled. FIG. **4** is a detailed view of a pulley assembly that is coupled to one of limbs in FIG. **3**. FIG. **5** is a side view showing the compound bow according to the first embodiment of the present invention after a bowstring has been pulled. FIG. **6** is a side view showing upper and lower pulley assemblies in order to describe operation of an indicator in the compound bow according to the first embodiment of the present invention.

Referring to FIGS. **3** to **6**, a self-tunable compound bow according to a first embodiment of the present invention includes: a bow main body **100** including a pair of limbs **103** that are respectively coupled to both ends of a handle **102**; upper and lower pulley assemblies **107** and **108** that are respectively coupled to the rear end of each limb **103**; a bowstring **140**; first and second cam cables **150***a* and **150***b* that are wound around a cam **200** of each of the upper and lower pulley assemblies **107** and **108** as the bowstring **140** is pulled; a contact pin **502** that is coupled to a coupling hole **503** formed in a pulley **110** of one pulley assembly **108**; and an indicator **400** that is moved in contact with the second cam cable **150***b* in a guide hole **403** formed in a pulley **110** of the other pulley assembly **107**.

As shown, the compound bow according to the first embodiment of the present invention employs a dual cam system the respective components of which will be described below in more detail. First, the bow main body **100** includes a handle **102** at a central portion of which a grip portion is formed so as to be gripped by a user, and a pair of limbs **103** that are respectively coupled to both ends of the handle **102** in which two branches are formed at the rear portion of each limb **103**. A rotating shaft **101** is formed at the rear end of each limb **103**, in which a pulley assembly **107** or **108** is rotatably coupled on the rotating shaft **101** between the two branches at the rear end of each limb **103**. A cable guard **105** that pushes the cam cables **150***a* and **150***b* to one side of the bowstring **140** is coupled at the central portion of the handle **102**, in order to prevent an arrow from being interrupted during shooting.

Then, each of the upper and lower pulley assemblies **107** and **108** is rotatably coupled to the rotating shaft **101** at the rear end of each limb **103**, and includes: a pulley **110** that is rotatably coupled to the rotating shaft **101** formed at the rear end of each limb **103**; and a cam **200** coupled to one side of the pulley **110** and rotating with the pulley **110**, since the upper and lower pulley assemblies **107** and **108** are symmetrical with each other and have an identical configuration.

Each pulley **110** is formed of an oval-like plate-shaped member, and has an eccentric through-hole that is formed at the center of the pulley **110** and through which the rotating shaft **101** is coupled. Further, a guide groove that is depressed down to a predetermined depth is formed on the outer circumferential surface of each pulley **110** so that the bowstring **140** may be wound on the outer circumferential surface of each pulley **110**. A fixing protrusion **111** for fixing one end of the bowstring **140** wound on the guide groove is formed at one side of each pulley **110**. In addition, fixing protrusions **112** and **113** are formed in each pulley **110** in which the cam cables **150***a* and **150***b* are fixed to the fixing protrusions **112** and **113**, respectively.

The cam **200** is formed in each pulley **110** and is rotated with rotation of the pulley **110**, and includes: a cam cable winding portion **210** fabricated in an arc-shaped form and on which one of the cam cables **150***a* and **150***b* is wound; and a cam module **220** that has a pivot shaft **221** at a position spaced by a predetermined distance from the rotating shaft **101** of the pulley **110** to which the cam **200** is coupled, and that is rotatably coupled to the pivot shaft **221** by a predetermined angle from the cam cable winding portion **210**, in which a cam cable winding groove is formed on the outer circumferential surface of the cam module **220**, and the one of the cam cables **150***a* and **150***b* is wound around the cam cable winding portion **210** and then sequentially wound on the outer circumferential surface of the cam module **220** when the bowstring **140** is pulled.

In addition, the cam **200** further includes a fixing unit that makes the cam module **220** rotated by a predetermined angle with respect to the pivot shaft **221** in order to control the draw length of the let-off state of the compound bow, and that makes the cam module **220** fixed to the pulley **110** at a position where the cam module **220** has been rotated.

The cam cable winding portion **210** is arc-shaped so that the cam cables **150***a* and **150***b* are wound on the cam cable winding portion **210**, when the bowstring **140** is pulled, in which the cam cables **150***a* and **150***b* are respectively coupled to the fixing protrusions **112** and **113** that are located in the vicinity of the cam cable winding portion **210**. In addition, a cam cable winding groove is formed on the outer circumferential surface of the cam cable winding portion **210** so that one of the cam cables **150***a* and **150***b* is wound on the outer circumferential surface of the cam cable winding portion **210**.

The cam module **220** has the pivot shaft **221** at a position spaced by a predetermined distance from the rotating shaft **101** of the pulley **110** to which the cam **200** is coupled, and is rotatably coupled to the pivot shaft **221** by a predetermined angle from the cam cable winding portion **210**, and is configured to have a gentle slope portion **222** formed of a gentle arc-shaped curve and a steep slope portion **223** that is extended from the gentle slope portion **222** to be close to the rotating shaft **101**, to thus form a steep slope. Further, the cam cable winding grooves on which the cam cables **150***a* and **150***b* are wound are formed on the outer circumferential surfaces of the gentle slope portion **222** and the steep slope portion **223**. Accordingly, the cam module **220** is rotated along with the pulley **110** when the bowstring **140** is pulled, and thus the cam cables **150***a* and **150***b* are sequentially wound on the gentle slope portion **222** and the steep slope portion **223** of the cam module **220** adjacent to the cam cable winding portion **210**.

The fixing unit makes the cam module **220** fixed to the pulley **110** at a position where the cam module **220** has been rotated. To this end, an arc-shaped positioning hole **230** centered at the pivot shaft **221** is formed in the cam module **220**, and a coupling hole (not shown) is formed in the pulley **110** to which the cam module **220** is coupled. Thus, when the cam module **220** is rotated by a predetermined angle around the pivot shaft **221**, and a coupling member **115** is coupled to the coupling hole (not shown) formed in the pulley **110** at a predetermined position of the positioning hole **230**, the cam module **220** is coupled to the pulley **110**. In the present invention, when a bolt as the coupling member **115** is inserted into the positioning hole **230** and is screw-coupled into the coupling hole (not shown) formed in the pulley **110**, the cam module **220** is coupled to the pulley **110**. In addition, a position display part indicated by numbers are provided around the positioning hole **230**, in order to display position at which the cam module **220** is fixed. The cam modules **220** that are respectively coupled to the upper and lower pulley assemblies **107** and **108** should have an identical rotational angle, and thus the position display part is indicated by numbers so as to see the rotational angle of each cam module **220**. Of course, the position display part may be indicated by alphabetical letters instead of Arabic numbers.

The cam module **220** having such a structure in the present invention can adjust the draw length of the bowstring **140**. Thus, when the cam module **220** of each of the upper and lower pulley assemblies **107** and **108** is identically rotated by an identical angle from the cam cable winding portion **210** around the pivot shaft **221** and the cam module **220** is again secured to the pulley **110** at a position where the cam module **220** has been rotated, the length of one of the cam cables **150***a* and **150***b* that is wound on the gentle slope portion **222** of the cam module **220** increases in comparison with the previous embodiment. At last, the length of one of the cam cables **150***a* and **150***b* that is wound from the cam cable winding portion **210** to the cam module **220** until the let-off state increases, to thereby increase the draw length of the bowstring **140**.

The bowstring **140** is wound in the guide groove of the pulley **110** of each pulley assembly **107** or **108** and thus both ends of the bowstring **140** are coupled to the fixing protrusions **111** formed on the respective pulleys **110**.

The cam cables **150***a* and **150***b* are formed between a pair of the limbs **103** of the bow main body **100** and are wound on the cams **200** formed in the respective pulleys **110**, as the bowstring **140** is pulled. One end of each of the cam cables **150** *a* and **150***b* is coupled to the fixing protrusion **113** formed on the pulley **110** of one of the pulley assemblies **107** and **108**, and then is wound around the rotating wheel **120** that is rotatably coupled to the rotating shaft **101**, to then be extended toward the other one of the pulley assemblies **107** and **108**, and the other end of each of the cam cables **150***a* and **150***b* is fixed to the fixing protrusion **112** of the pulley **110** of the other one of the pulley assemblies **107** and **108**. Therefore, as the bowstring **140** is pulled, the cam cables **150***a* and **150***b* are wound on the cam **200** that is coupled to the other pulley **110** of the pulley assemblies **107** and **108**.

The rotating wheel **120** is configured to have a through-hole at the center of the rotating wheel **120** in which the rotating shaft **101** of the pulley **110** is coupled into the through-hole, and is configured to be coupled to the rotating shaft **101** of the pulley **110** at the other side surface of the pulley **110**, that is, at the other side surface opposing one side surface of the pulley **110** to which the cam **200** is coupled, and to be rotatably coupled to the rotating shaft **101** of the pulley **110** separately from the pulley **110**. Further, the cam cable winding groove into which the cam cables **150***a* and **150***b* are wound is formed on the outer circumferential surface of the circular rotating wheel **120**. Thus, the cam cables **150***a* and **150***b* are wound on the rotating wheel **120** and then one end of one of the cam cables **150***a* and **150***b* is coupled to the fixing protrusion **113** formed on the pulley **110** in the vicinity of the

rotating wheel **120**. The cam cables **150***a* and **150***b* are wound on the cam **200** of the other pulley **110** by the pulling of the bowstring **140**, and accordingly a portion of the cam cables **150***a* and **150***b* wound on the rotating wheel **120** is released from the rotating wheel **120**. Here, since the rotating wheel **120** is rotatably coupled to the rotating shaft **101** separately from the pulley **110**, friction between each of the cam cables **150***a* and **150***b* and the rotating wheel **120** is reduced to thus reduce the pulling force of the bowstring **140**.

As shown in FIG. **6**, the contact pin **502** has a predetermined length and is fixed and coupled at a position of the coupling hole **503** formed in the pulley **110** of the lower pulley assembly **108** (e.g., at a position where the contact pin **502** contacts the first cam cable **150***a* in a let-off state), in which the contact pin **502** contacts the first cam cable **150***a* when the bowstring **140** is in a pulled state, that is, in a let-off state (called an arrow shooting state). In addition, the contact pin **502** is coupled to one end of a pivot member **500** the other end of which is pivotably coupled to a pivot shaft **501** formed in the pulley **110**. As described above, the cam module **220** of each pulley assembly **107** or **108** may be identically rotated by a predetermined angle from the cam cable winding portion **210** around the pivot shaft **221** in order to adjust the draw length in the present invention. Here, since the rotational angle of each pulley **110** is changed in the let-off state according to movement of the cam module **220**, position of the contact pin **502** is also moved accordingly. In addition, the pivot member **500** is rotated by a predetermined angle around a pivot shaft **501** so that the contact pin **502** can be moved to a predetermined position in the coupling hole **503** at a state where fixing of the contact pin **502** is released in the coupling hole **503**, and then the contact pin **502** is fixed in the coupling hole **503**. For this purpose, the contact pin **502** is detachably coupled with the coupling hole **503** in a screw coupling structure. The coupling hole **503** is fabricated in an arc-shaped form around the pivot shaft **501** so that the contact pin **502** can be guided in the coupling hole **503** as the pivot member **500** is pivoted around the pivot shaft **501**, and a position display part **504** is formed in the vicinity of the coupling hole **503** in order to identify position where the contact pin **502** is coupled. In the present embodiment, the position display part **504** is configured to have a plurality of lines spaced apart from each other at intervals, but may be of numeric or alphabetic characters.

An indicator **400** is moved in contact with the second cam cable **150***b* in a guide hole **403** formed in the pulley **110** of the upper pulley assembly **107**, as the bowstring **140** is pulled, in which one end of the indicator **400** is rotatably coupled to a pivot shaft **401** formed at a position spaced apart by a predetermined distance from the rotating shaft **101** in the upper pulley **110**, and a contact protrusion **402** is formed at the other end of the indicator **400** in which the contact protrusion **402** is moved in contact with the second cam cable **150***b* in the guide hole **403** of an arc shape. The guide hole **403** is formed at a position corresponding to the coupling hole **503** of the lower pulley **110**. The guide hole **403** is fabricated in an arc-shaped form around the pivot shaft **401** so that the contact protrusion **402** can be guided in the guide hole **403** as the indicator **400** is pivoted around the pivot shaft **401**.

As shown in FIGS. **3** to **6**, the other end of the indicator **400** having such a configuration to which the contact protrusion **402** is coupled is rotated with the pulley **110** while maintaining the coupled position in the guide hole **403** at an initial time the bowstring **140** is pulled, but when the contact protrusion **402** comes to contact the second cam cable **150***b*, the pulley **110** continues to rotate and thus the contact protrusion **402** is pushed by the second cam cable **150***b* to thus be moved in the guide hole **403**. Accordingly, the other end of the indicator **400** or the contact protrusion **402** is coupled to the guide hole **403**, with strength enough to move in contact with the second cam cable **150***b*. Further, a position display part **404** is formed in the vicinity of the guide hole **403** in order to identify position where the contact protrusion **402** is moved in the guide hole **403**. In the present embodiment, the position display part **404** is configured to have a plurality of lines spaced apart from each other at intervals, but may be of numeric or alphabetic characters.

The operation of the compound bow according to the first embodiment of this invention will be described below.

As shown in FIGS. **3** and **4**, before the bowstring **140** is pulled, the contact pin **502** of the lower pulley assembly **108** is fixed and coupled in the coupling hole **503** at a position in contact with the first cam cable **150***a* in the let-off state depending on the position of the cam module **220**. Then, at the upper pulley assembly **107**, the indicator **400** is disposed so that the contact protrusion **402** is located at one end of the guide hole **403** (toward the front end of the guide hole **403** in the direction where the pulley is rotated). When the bowstring **140** is pulled, the indicator **400** is rotated along with rotation of the pulley **110** at a state where position of the contact protrusion **402** is maintained in the guide hole **403**, and when the contact protrusion **402** comes to contact the second cam cable **150***b*, the pulley **110** continues to rotate and thus the contact protrusion **402** is pushed by the second cam cable **150***b* to thus be moved in the guide hole **403**.

In addition, the contact pin **502** formed in the lower pulley assembly **108** is coupled and fixed in the coupling hole **503**, and is rotated together with the pulley **110**, while the position of the contact pin **502** is maintained. The contact pin **502** comes to contact the first cam cable **150***a* in the let-off state.

That is, a state of a bow at a time when the bowstring **140** has been pulled, that is, at a let-off state where an arrow is shot is shown in FIG. **5**. FIG. **5** is a side view showing the compound bow when a bowstring **140** has been pulled in the case that the rotational angles of the respective cams **200** of the upper and lower pulley assemblies **107** and **108** are identical, in which a position where the indicator **400** is moved is consistent with position corresponding to the contact pin **502**. The indicator **400** is formed to move in the guide hole **403** only by contact with the cam cable **150***b*. Accordingly, the indicator **400** is located at an identical position even after the bowstring **140** has been released. Thus, a bowyer has released the bowstring **140** and then confirms that a position where the indicator **400** is moved in the guide hole **403** is consistent with position of the contact pin **502**, to thereby see that the rotational angles of the upper and lower cams **200** are identical.

However, due to a difference in strength of the limbs, the rotational angles of the upper and lower cams **200** can vary until the let-off state. Such an example is shown in FIG. **6**. FIG. **6** illustrates a case that the rotational angle of the cam **200** of the upper pulley assembly **107** is larger than that of the cam **200** of the lower pulley assembly **108**. In this case, since the rotational angle of the cam **200** of the upper pulley assembly **107** is larger than that of the cam **200** of the lower pulley assembly **108**, the contact protrusion **402** of the indicator **400** is also moved more in the guide hole **403**. Therefore, when a bowyer confirms that the movement position of the indicator **400** is moved more than the position of the contact pin **502**, by comparing the movement position of the indicator **400** with the position of the contact pin **502**, it can be seen that the rotational angle of the cam **200** coupled to the upper pulley assembly **107** is larger than that of the cam **200** coupled to the lower pulley assembly **108**. In this case, when the length of the cam cable **150***a* wound on the cam **200** of the upper pulley

assembly **107** is reduced, the rotational angle of the cam **200** can be reduced, to thus make the rotational angles of the upper and lower cams **200** identical.

Meanwhile, in the case that the rotational angle of the cam **200** of the upper pulley assembly **107** is smaller than that of the cam **200** of the lower pulley assembly **108**, the contact protrusion **402** of the indicator **400** is also moved less in the guide hole **403**. Therefore, when a bowyer confirms that the movement position of the indicator **400** is moved less than the position of the contact pin **502**, by comparing the movement position of the indicator **400** with the position of the contact pin **502**, it can be seen that the rotational angle of the cam **200** coupled to the upper pulley assembly **107** is smaller than that of the cam **200** coupled to the lower pulley assembly **108**. In this case, when the length of the cam cable **150***a* wound on the cam **200** of the upper pulley assembly **107** is increased, the rotational angle of the cam **200** can be increased, to thus make the rotational angles of the upper and lower cams **200** identical.

In the present invention as described above, even when the rotational angles of the upper and lower cams **200** differ from each other, it can be seen easily by a bowyer alone that the rotational angles of the cams **200** are changed differently from each other. Therefore, the rotational angles of the upper and lower cams **200** can be made identical by adjusting the length of the cam cable **150***a*.

Meanwhile, FIG. **7** illustrates another example of a coupling hole unit to which a contact pin **602** is coupled without using a pivot member **500**. In FIG. **7**, the coupling hole unit is configured to have a plurality of coupling holes **603** that are formed at regular intervals unlike the above-described embodiment, in which the contact pin **602** is coupled to one of the plurality of coupling holes **603**.

Determination of one of the coupling holes **603** to which the contact pin **602** is coupled, is changed according to a position to which the cam module **220** is moved from the cam cable winding portion **210**, like the above-described embodiment. In addition, the contact pin **602** is coupled to one of the coupling holes **603** by selecting the one of the coupling holes **603** that makes the contact pin **602** contact the first cam cable **150***a* in the let-off state at a position at which the cam module **220** has been changed.

On the following, a compound bow according to a second embodiment of the present invention will be described with reference to the accompanying drawings. FIG. **8** is a side view showing a compound bow according to a second embodiment of the present invention before a bowstring is pulled. FIG. **9** is a detailed view of a pulley assembly that is coupled to one of limbs in FIG. **8**. FIG. **10** is a partial exploded perspective view of FIG. **9**. FIG. **11** is a side view showing the compound bow according to the second embodiment of the present invention after a bowstring has been pulled. FIG. **12** is a side view showing upper and lower pulley assemblies in order to describe operation of an indicator in the compound bow according to the second embodiment of the present invention. FIG. **13** is a side view showing another example of a contact pin and a coupling hole in FIG. **12**.

The description of the compound bow according to the second embodiment of the present invention focuses on a different configuration from the description of the first embodiment of the present invention. In the compound bow according to the second embodiment of the present invention, a cam **200** is formed in a pulley **110** and is rotated with rotation of the pulley **110**, and includes: a cam cable winding portion **210** fabricated in an arc-shaped form and on which cam cables **150***a* and **150***b* are wound; and a cam module **220** that is rotatably coupled by a predetermined angle from the cam cable winding portion **210**, around a pivot point "A" at a position spaced by a predetermined distance from a rotating shaft **101** of the pulley **110** to which the cam **200** is coupled, in which a cam cable winding groove is formed on the outer circumferential surface of the cam module **220**, and the cam cables **150***a* and **150***b* are wound around the cam cable winding portion **210** and then sequentially wound on the outer circumferential surface of the cam module **220** when the bowstring **140** is pulled.

In addition, the cam **200** further includes a fixing unit that makes the cam module **220** fixed to the pulley **110** at a position where the cam module **220** has been rotated by a predetermined angle around the pivot point "A" in order to control the draw length of the let-off state of the compound bow.

The fixing unit makes the cam module **220** fixed to the pulley **110** at a position where the cam module **220** has been rotated by a predetermined angle around the pivot point "A". To this end, an arc-shaped positioning hole **230** centered at the pivot point "A" is formed in the cam module **220**, and a coupling hole (not shown) is formed in the pulley **110** to which the cam module **220** is coupled. Thus, when the cam module **220** is rotated by a predetermined angle around the pivot point "A," and a coupling member **115** is coupled to the coupling hole (not shown) formed in the pulley **110** at a predetermined position of the positioning hole **230**, the cam module **220** is coupled to the pulley **110**. In the present invention, when a bolt as the coupling member **115** is inserted into the positioning hole **230** and is screw-coupled into the coupling hole (not shown) formed in the pulley **110**, the cam module **220** is coupled to the pulley **110**. In addition, as the fixing unit, an arc-shaped coupling hole **116** centered at the pivot point "A" is additionally formed in the pulley **110**, like the arc-shaped positioning hole **230**, and a bolt **117** is coupled to a bolt hole formed at a predetermined position of the cam module **220**. Since the bolt **117** passes through the arc-shaped coupling hole **116** formed in the pulley **110** and then one end of the bolt **117** is coupled to a nut, the cam module **220** is additionally fixed to the pulley **110**.

The cam module **220** having such a structure in the present embodiment can adjust the draw length of the bowstring **140**. Thus, when the cam module **220** of each of the upper and lower pulley assemblies **107** and **108** is identically rotated by an identical angle from the cam cable winding portion **210** around the pivot point "A" and the cam module **220** is again secured to the pulley **110** at a position where the cam module **220** has been rotated, the length of one of the cam cables **150***a* and **150***b* that is wound on the gentle slope portion **222** of the cam module **220** increases in comparison with the previous embodiment. At last, the length of one of the cam cables **150***a* and **150***b* that is wound from the cam cable winding portion **210** to the cam module **220** until the let-off state increases, to thereby increase the draw length of the bowstring **140**.

In this embodiment, as shown in FIGS. **9** and **10**, an indicator **400** is moved in contact with the second cam cable **150***b* in a guide hole **403** formed in the pulley **110** of the upper pulley assembly **107**, as the bowstring **140** is pulled. The indicator **400** includes: a contact protrusion **410** and a support member **420** that are coupled to each other by two coupling members that are spaced apart from each other at a certain gap along the guide hole **403** at both side surface of the guide hole **403**. One of the two coupling members is a bolt **430** that couples the contact protrusion **410** and the support member **420** separably, and the other one thereof is a coupling pin **421** that is spaced apart from the bolt **430** along the guide hole **403** and formed in the support member **420**. Thus, a bolt hole **411** and a pin hole **412** that are respectively coupled to the bolt **430**

and the coupling pin **421** are formed spaced apart with a gap from each other along guide hole **403** in the contact protrusion **410**. A female screw portion is formed in the bolt hole **411** to which the bolt **430** is coupled. In addition, the coupling pin **421** that is inserted into the pin hole **412** of the contact protrusion **410** is formed in the support member **420**. Further, a bolt hole **422** through which the bolt **430** is coupled is formed at a position spaced from the coupling pin **421**.

The reason why the contact protrusion **410** and the support member **420** of the indicator **400** are coupled by the two coupling members is that the coupling members such as the bolt may be inclined due to a gap between a portion where the second cam cable **150***b* contacts in the contact projection **410** and the guide hole **403** in the case that the contact protrusion **410** and the support member **420** are coupled with a single coupling member, and thus the indicator **400** is not smoothly in the guide hole **403**. Therefore, according to the present embodiment, since the contact protrusion **410** and the support member **420** of the indicator **400** are coupled by the two coupling members that are spaced apart from each other at a certain gap along the guide hole **403**, the indicator **400** can be smoothly moved in contact with the second cam cable **150***b*.

In addition, a contact rubber pad **440** is provided between the contact protrusion **410** and the support member **420** of the indicator **400**, in which the contact rubber pad **440** is inserted in the guide hole **403** and contacts an inner circumferential surface of the guide hole **403**. As shown in FIG. **10**, the contact rubber pad **440** is fitted between the bolt **430** and the coupling pin **421** that are the two coupling members in the guide hole **403**. Before the indicator **400** contacts the second cam cable **150***b*, the contact rubber pad **440** makes the indicator **400** maintained at an original position in the guide hole **403**. When the indicator **400** contacts the second cam cable **150***b*, the contact rubber pad **440** plays a role of making the indicator **400** smoothly move in the guide hole **403**.

The guide hole **403** to which the indicator **400** is coupled at a position in the upper pulley **110** in correspondence to the coupling hole **803** in the lower pulley **110**, and is fabricated in an arc-shaped form centered at the rotating shaft **101**.

As shown in FIGS. **8** to **12**, the indicator **400** having such a configuration is rotated with the pulley **110** while maintaining the coupled position in the guide hole **403** at an initial time the bowstring **140** is pulled, but when the contact protrusion **402** comes to contact the second cam cable **150***b*, the pulley **110** continues to rotate and thus the contact protrusion **402** is pushed by the second cam cable **150***b* to thus be moved in the guide hole **403**. Accordingly, the indicator **400** is coupled to the guide hole **403**, with strength enough to move in contact with the second cam cable **150***b*. Further, a position display part **404** is formed in the vicinity of the guide hole **403** in order to identify position where the indicator **400** is moved in the guide hole **403**. The position display part **404** is configured to have a plurality of lines and numbers spaced apart from each other at intervals, like the position display part **804** in the vicinity of the coupling hole **803**, but may be of alphabetic characters instead of numbers.

As shown in FIG. **12**, a contact pin **800** has a predetermined length of an arc-shaped form and is fixed and coupled at a position of a coupling hole **803** formed in the pulley **110** of the lower pulley assembly **108** (e.g., at a position where the contact pin **800** contacts the first cam cable **150***a* in a let-off state), in which the contact pin **800** contacts the first cam cable **150***a* when the bowstring **140** is in a pulled state, that is, in a let-off state (called an arrow shooting state). In addition, the contact pin **800** is configured to have a contact protrusion and a support member that contact the first cam cable **150***a* like the indicator **400**, and is separably coupled at both side surfaces of the coupling hole **803** by a bolt **830**. The contact protrusion and the support member of the contact pin **800** are similar to those of the above-described indicator **400**, and thus the detailed description thereof will be omitted.

As described above, the cam module **220** of each pulley assembly **107** or **108** may be identically rotated by a predetermined angle from the cam cable winding portion **210** around the pivot point "A" in order to adjust the draw length in the present invention. Here, since the rotational angle of each pulley **110** is changed in the let-off state according to movement of the cam module **220**, position of the contact pin **800** is also moved accordingly. Here, the bolt **830** that couples the contact pin **800** to the coupling hole **503** is released to thus release the fixing of the contact pin **800**. At the state where the fixing of the contact pin **800** has been released, the contact pin **800** is moved to a predetermined position in the coupling hole **803**, and then the contact pin **800** is fixedly coupled to the coupling hole **803** again. The coupling hole **803** in which the contact pin **800** is moved is fabricated in an arc-shaped form around the rotating shaft **101**. A position display part **804** is formed in the vicinity of the coupling hole **803** in order to identify position where the contact pin **800** is coupled. In the present embodiment, the position display part **804** is configured to have a plurality of lines and numbers spaced apart from each other at intervals, but may be of numeric or alphabetic characters.

The operation of the compound bow according to the second embodiment of this invention will be described below.

As shown in FIGS. **8** and **9**, before the bowstring **140** is pulled, the contact pin **800** of the lower pulley assembly **108** is fixed and coupled in the coupling hole **803** at a position in contact with the first cam cable **150***a* in the let-off state depending on the position of the cam module **220**. Then, at the upper pulley assembly **107**, the indicator **400** is disposed so that the contact protrusion **410** is located at one end of the guide hole **403** (toward the front end of the guide hole **403** in the direction where the pulley is rotated). When the bowstring **140** is pulled, the indicator **400** is rotated along with rotation of the pulley **110** at a state where position of the contact protrusion **410** is maintained in the guide hole **403**, and when the contact protrusion **410** comes to contact the second cam cable **150***b*, the pulley **110** continues to rotate and thus the contact protrusion **410** is pushed by the second cam cable **150***b* to thus be moved in the guide hole **403**.

In addition, the contact pin **800** formed in the lower pulley assembly **108** is coupled and fixed in the coupling hole **803**, and is rotated together with the pulley **110**, while the position of the contact pin **800** is maintained. The contact pin **800** comes to contact the first cam cable **150***a* in the let-off state.

That is, a state of a bow at a time when the bowstring **140** has been pulled, that is, at a let-off state where an arrow is shot is shown in FIGS. **11** and **12**. FIG. **12** is a side view showing the compound bow when a bowstring **140** has been pulled in the case that the rotational angles of the respective cams **200** of the upper and lower pulley assemblies **107** and **108** are identical, in which a position where the indicator **400** is moved is consistent with position corresponding to the contact pin **800**. The indicator **400** is formed to move in the guide hole **403** only by contact with the cam cable **150***b*. Accordingly, the indicator **400** is located at an identical position even after the bowstring **140** has been released. Thus, a bowyer has released the bowstring **140** and then confirms that a position where the indicator **400** is moved in the guide hole **403** is consistent with position of the contact pin **800**, to thereby see that the rotational angles of the upper and lower cams **200** are identical.

However, due to a difference in strength of the limbs, the rotational angles of the upper and lower cams **200** can vary until the let-off state. In the case that the rotational angle of the cam **200** of the upper pulley assembly **107** is larger or smaller than that of the cam **200** of the lower pulley assembly **108**, the length of the cam cable **150***a* wound on the cam **200** of the upper pulley assembly **107** is reduced or increased, the rotational angle of the cam **200** can be changed, to thus make the rotational angles of the upper and lower cams **200** identical.

In the present invention as described above, even when the rotational angles of the upper and lower cams **200** differ from each other, it can be seen easily by a bowyer alone that the rotational angles of the cams **200** are changed differently from each other. Therefore, the rotational angles of the upper and lower cams **200** can be made identical by adjusting the length of the cam cable **150***a*.

Meanwhile, FIG. **13** illustrates another example of a coupling hole unit to which a contact pin **602** is coupled. In FIG. **13**, the coupling hole unit is configured to have a plurality of coupling holes **603** that are formed at regular intervals, in which the contact pin **602** is coupled to one of the plurality of coupling holes **603**.

Determination of one of the coupling holes **603** to which the contact pin **602** is coupled, is changed according to a position to which the cam module **220** is moved from the cam cable winding portion **210**. In addition, the contact pin **602** is coupled to one of the coupling holes **603** by selecting the one of the coupling holes **603** that makes the contact pin **602** contact the first cam cable **150***a* in the let-off state at a position where the cam module **220** has been changed.

Here, a detailed description of other configurations and operational effects of the second embodiment similar to those of the first embodiment will be omitted.

As described above, the present invention has been described with respect to particularly preferred embodiments. However, the present invention is not limited to the above embodiments, and it is possible for one who has an ordinary skill in the art to make various modifications and variations, without departing off the spirit of the present invention. Thus, the protective scope of the present invention is not defined within the detailed description thereof but is defined by the claims to be described later and the technical spirit of the present invention.

What is claimed is:

1. A self-tunable compound bow comprising:

a bow main body including a handle at a central portion of which a grip portion is provided and a pair of limbs that are respectively coupled to opposite ends of the handle;

upper and lower pulley assemblies each including a pulley that is rotatably coupled to a rotating shaft provided on the rear end of each limb, and a cam that is coupled to one side of the pulley for rotating with the pulley;

a bowstring comprising opposite ends respectively wound and coupled to the pulleys of the upper and lower pulley assemblies;

first and second cam cables that wind around the cam of each of the upper and lower pulley assemblies as the bowstring is pulled, in which one end of each of the first and second cam cables is coupled to one of the upper and lower pulley assemblies, and the other end of the first and second cam cables is coupled to the other of the upper and lower pulley assemblies;

a contact pin operatively coupled to an arcuate coupling hole of the pulley of the one of the pulley assemblies to rotate together with the pulley while remaining fixed in the arcuate coupling hole until coming into contact with the first cam cable during pulling of the bowstring towards a let-off state, wherein the contact of the contact pin with the first cam cable causes the contact pin to move lengthwise along the arcuate coupling hole during further pulling of the bowstring to the let-off state; and

an indicator operatively coupled to an arcuate guide hole of the pulley of the other of the pulley assemblies to rotate together with the pulley of the other of the pulley assemblies while remaining fixed in the arcuate guide hole until coming into contact with the second cam cable during the pulling of the bowstring towards the let-off state, wherein the contact of the indicator with the second cam cable cause the indicator to move lengthwise along the arcuate guide hole during the further pulling of the bowstring to the let-off state.

2. The self-tunable compound bow of claim **1**, wherein:

the contact pin is positioned in a first position in the arcuate coupling hole after the further pulling of the bowstring to the let-off state, and the contact pin remains in the first position after release of the bowstring from the let-off state; and

the indicator is positioned in a second position in the arcuate guide hole after the further pulling of the bowstring to the let-off state, and the indicator remains in the second position after release of the bowstring from the let-off state.

3. The self-tunable compound bow of claim **1**, wherein the indicator comprises a first end rotatably coupled to a pivot shaft of the pulley of the other of the pulley assemblies, and an opposite second end comprising a contact protrusion that moves along the arcuate guide hole during the further pulling of the bowstring to the let-off state.

4. The self-tunable compound bow of claim **1**, wherein the guide hole is associated with a position display that displays a position to which the indicator moves during the further pulling of the bowstring to the let-off state.

5. The self-tunable compound bow of claim **2**, wherein the compound bow is self-tunable by comparing the first position of the contact pin after release of the bowstring from the let-off state with the second position of the indicator after the release of the bowstring from the let-off state.

6. A self-tunable compound bow comprising:

a bow main body including a handle at a central portion of which a grip portion is provided and a pair of limbs that are respectively coupled to opposite ends of the handle;

upper and lower pulley assemblies each including a pulley that is rotatably coupled to a rotating shaft provided on the rear end of each limb, and a cam that is coupled to one side of the pulley for rotating with the pulley;

a bowstring comprising opposite ends respectively wound and coupled to the pulleys of the upper and lower pulley assemblies;

first and second cam cables that wind around the cam of each of the upper and lower pulley assemblies as the bowstring is pulled, in which one end of each of the first and second cam cables is coupled to one of the upper and lower pulley assemblies, and the other end of the first and second cam cables is coupled to the other of the upper and lower pulley assemblies;

a contact pin coupled to a coupling hole of the pulley of the one of the pulley assemblies to come into contact with the first cam cable when the bowstring is pulled towards the let-off state; and

an indicator operatively coupled to an arcuate guide hole of the pulley of the other of the pulley assemblies to rotate together with the pulley of the other of the pulley assemblies while remaining fixed in the arcuate guide hole until coming into contact with the second cam cable

during pulling of the bowstring towards the let-off state, wherein the contact of the indicator with the second cam cable cause the indicator to move lengthwise along the arcuate guide hole during further pulling of the bowstring to the let-off state.

7. The self-tunable compound bow of claim **6**, wherein the pulley of the one of the pulley assemblies comprises at least one additional coupling hole to establish a plurality of coupling holes, wherein the contact pin is coupled to one of the plurality of the coupling holes.

8. The self-tunable compound bow of claim **6**, wherein the indicator is positioned in a position in the arcuate guide hole after the further pulling of the bowstring to the let-off state, and the indicator remains in the identical position after release of the bowstring from the let-off state.

9. The self-tunable compound bow of claim **6**, wherein the indicator comprises a first end rotatably coupled to a pivot shaft of the pulley of the other of the pulley assemblies, and an opposite second end comprising a contact protrusion that moves along the arcuate guide hole during the further pulling of the bowstring to the let-off state.

10. The self-tunable compound bow of claim **6**, wherein the guide hole is associated with a position display that displays a position to which the indicator moves during the further pulling of the bowstring to the let-off state.

* * * * *